

06/15/00

JC662 U.S. PRO

**UTILITY PATENT APPLICATION TRANSMITTAL  
(Large Entity)***(Only for new nonprovisional applications under 37 CFR 1.53(b))*Docket No.  
1224

Total Pages in this Submission

**TO THE ASSISTANT COMMISSIONER FOR PATENTS**Box Patent Application  
Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

**METHOD OF REPEAT TRANSMISSION OF MESSAGES IN A CENTRALLY CONTROLLED  
COMMUNICATION NETWORK**

and invented by:

Vasco VOLLMER, Markus RADIMIRSCH

06/15/00  
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1595260If a **CONTINUATION APPLICATION**, check appropriate box and supply the requisite information:☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: \_\_\_\_\_

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Enclosed are:

**Application Elements**

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 15 pages and including the following:
  - a. ☒ Descriptive Title of the Invention
  - b. ☐ Cross References to Related Applications *(if applicable)*
  - c. ☐ Statement Regarding Federally-sponsored Research/Development *(if applicable)*
  - d. ☐ Reference to Microfiche Appendix *(if applicable)*
  - e. ☒ Background of the Invention
  - f. ☒ Brief Summary of the Invention
  - g. ☒ Brief Description of the Drawings *(if drawings filed)*
  - h. ☒ Detailed Description
  - i. ☒ Claim(s) as Classified Below
  - j. ☒ Abstract of the Disclosure

**UTILITY PATENT APPLICATION TRANSMITTAL**  
**(Large Entity)**

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**Application Elements (Continued)**

3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*
- a. ☒ Formal                      Number of Sheets 1
- b. ☐ Informal                      Number of Sheets \_\_\_\_\_
4. ☒ Oath or Declaration
- a. ☐ Newly executed *(original or copy)*                      ☒ Unexecuted
- b. ☐ Copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional application only)*
- c. ☒ With Power of Attorney                      ☐ Without Power of Attorney
- d. ☐ DELETION OF INVENTOR(S)  
Signed statement attached deleting inventor(s) named in the prior application,  
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference *(usable if Box 4b is checked)*  
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied  
under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby  
incorporated by reference therein.
6. ☐ Computer Program in Microfiche *(Appendix)*
7. ☐ Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all must be included)*
- a. ☐ Paper Copy
- b. ☐ Computer Readable Copy *(identical to computer copy)*
- c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

**Accompanying Application Parts**

8. ☐ Assignment Papers *(cover sheet & document(s))*
9. ☐ 37 CFR 3.73(B) Statement *(when there is an assignee)*
10. ☐ English Translation Document *(if applicable)*
11. ☐ Information Disclosure Statement/PTO-1449                      ☐ Copies of IDS Citations
12. ☐ Preliminary Amendment
13. ☒ Acknowledgment postcard
14. ☒ Certificate of Mailing
- ☐ First Class                      ☒ Express Mail *(Specify Label No.):* EK 069303332 US

# UTILITY PATENT APPLICATION TRANSMITTAL (Large Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.  
1224

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## Accompanying Application Parts (Continued)

15. ☒ Certified Copy of Priority Document(s) (if foreign priority is claimed)

16. ☐ Additional Enclosures (please identify below):

## Fee Calculation and Transmittal

### CLAIMS AS FILED

For	#Filed	#Allowed	#Extra		Rate	Fee
Total Claims	18	- 20 =	0	x	\$18.00	\$0.00
Indep. Claims	1	- 3 =	0	x	\$78.00	\$0.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>						\$0.00
BASIC FEE						\$690.00
OTHER FEE (specify purpose) _____						
TOTAL FILING FEE						\$690.00

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  - ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

  
Signature

Dated: JUNE 15, 2000

cc:

**BE IT KNOWN** that **We**, Vasco VOLLMER and Markus RADIMIRSCH,  
citizens of Germany, whose post office addresses are, respectively,  
Hahnenberger Strasse 16, 29471 Gartow, Germany; and Wirringer Garten 2,  
30880 Laatzen, Germany, have invented certain new and useful improvements  
5 in a

**METHOD OF REPEAT TRANSMISSION OF MESSAGES  
IN A CENTRALLY CONTROLLED COMMUNICATION NETWORK**

of which the following is a complete specification thereof:

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention relates to a method of repeat transmission of  
5 messages in a centrally controlled communication network.

### 2. Prior Art

In a centrally controlled, especially cellular, radio network, a central  
station ZE is provided, as shown in Fig. 1, to which several terminals T1, T2,..  
can be connected. These terminals can be, for example, telephones, but also  
10 could be PCs (personal computers) or other units. This type of system operates,  
for example, in a link-oriented mode, i.e. prior to exchange of data with other  
terminals that are connected to the network or the central station ZE, at least  
one link or connection must be established.

Besides this connection or link in which only one terminal is operated,  
15 there are also connections or links, in which several or all terminals are  
simultaneously operated (Multicast, Broadcast). Complete error correction does  
not occur in the existing systems. However high error probabilities must be taken  
into account, especially in radio transmissions. Various methods have been  
developed to permit error sensitive transmission of data. In most cases a  
20 combination of error protective coding (Forward Error Correction, FEC) and  
automatic repeat requests (ARQ) are used. FEC is based on redundancies  
added in transmission, so that the message still can be corrected and received  
in the receiver without error, when it contains a few transmission errors. ARQ in

contrast is based on the assumption that the receiver can establish when a message was transmitted containing errors. This is generally achieved by using an additional check sum. When the receiver detects an error, it asks the transmitter to send this data packet to it again. For this latter method a

5      bidirectional transmission is necessarily required. ARQ has already been investigated in detail and used in many variations for different applications (high and low error probabilities optimized, as described in A.S. Tanenbaum, "Computernetzwerke [Computer network]", Prentice Hall, München, 1998, pp. 227 to 244; B. Walke, "Mobilfunknetze und ihre Protokolle [Mobil Radio Network

10      and its Protocols]", B. G. Teubner, Stuttgart, 1998, pp. 91 to 99; D. Petras. "Entwicklung und Leistungsbewertung einer ATM-Funkschnittstelle [Development and Performance Evaluation of an ATM Radio Interface]", Dissertation in RWTH Aachen, 1998, Chapter 8.3, pp. 81 to 85; and D. Bertsekas, R. Gallager, "Data

15      Networks", Prentice-Hall, Englewood Cliffs, New Jersey, 1992, pp. 64 to 68. All these methods however are based on a bidirectional connection or link, i.e. generally a point-to-point link.

### **Summary of the Invention**

20

It is an object of the present invention to provide an improved method for repeat transmission of messages in a centrally controlled communication network.

According to the invention the method for repeat transmission of messages in a centrally controlled communication network, especially a radio network, in which several terminals are simultaneously operable in a participating group, comprises the following steps:

5           a) transmitting of each of the messages from the central station only once for reception by the several terminals of the participating group and assigning a respective identifier to the corresponding messages to detect whether or not a transmitted message was incorrect or lost;

10           b) as soon as a terminal has established an error in or loss of a transmitted message, it issues a repeat request for a repeat transmission of this message over another communication link, especially a point-to-point link, between the central station and the terminal establishing the error or the loss; and

15           c) the central station repeats transmission of the erroneous or lost message in response to the repeat request within a predetermined time interval.

Features of preferred embodiments of the method are set forth in appended dependent claims.

During broadcast and multi-cast links, i.e. operating modes, in which terminals are simultaneously operated by the central station, it is possible to  
20   transmit repeat requests for repetition of message transmissions with the method according to the invention. Also a message, which should be received by the several terminals of a participating group, is only transmitted once for reception by all participating terminals but the single transmission is received and

processed by all participating terminals. The multi-cast operation (groups of several selected terminals of a radio cell) or also broadcast operation (all terminals found in the cell) happens in the current communication systems only in one direction, namely from the central station to the terminals (down-link).

- 5 The method according to the invention uses another communication link, preferably an existing point-to-point link, between a terminal of the multi-cast group and/or broadcast participants and the central station in order to be able to perform a simple protocol for repeat requests, when a repetition of an error-containing or lost message is required within a predetermined time interval.
- 10 Because of that the probability for transmission of an error-containing data packet is clearly reduced, without expensive error protecting measures being required. Since a point-to-point transmission for exchange of control information between the terminals and the central station, especially in HIPERLAN Type 2 communication systems, is provided anyway, no additional expenses for
- 15 transmission of repeat requests are produced by the method according to the invention.

Repeat requests are of great importance, especially in radio networks, since error-free transmission of data with conventional methods (FEC) cannot be guaranteed because of physically limiting high error rates. In current

20 conventional applications, such as speech transmission or image transmission, see GSM, DVB-T, this is not important, since they tolerate errors to a certain extent. In speech transmission a transmission error generally is noticeable only as a brief interfering noise. However when electronic data, such a software



programs or documents, must be transmitted over a radio network, scarcely any errors are tolerated, since they would in most cases make the entire data unreadable.

5

### **Brief Description of the Drawing**

The objects, features and advantages of the invention will now be illustrated in more detail with the aid of the following description of the preferred embodiments, with reference to the accompanying figures in which:

Fig. 1 is a diagram of a centrally controlled communications network in which the method according to the invention can be used;

Fig. 2 is a diagram showing the course of a repeat request of an error-containing message; and

Fig. 3 is a diagram illustrating control of the time interval.

15

### **Description of the Preferred Embodiments**

The method according to the invention for repeat transmission of messages is performed by the centrally controlled communication network, especially a HIPERLAN Type 2 communication system, illustrated in Fig. 1. The method according to the invention can of course also be applied to processes with other signaling.

In HIPERLAN Type 2 communication systems a terminal T1, T2,... is assigned a temporary address, as long as it is connected with the central

station, i.e. is announced as a network participant. The temporary address (MAC-ID) is used during communication in order to address a terminal definitely within a cell. One or more predetermined addresses is or are provided for broadcast and multi-cast transmissions. The central station ZE transmits

5 broadcast and multi-cast messages with the predetermined address or addresses as target or targets. All terminals in a cell, or all which belong to a multi-cast group, receive these messages. As in point-to-point links the messages contain an identifying feature, e.g. a running number (sequence number SN), with the aid of which a terminal can detect, whether a message is

10 lost in the transmission or decoding. As soon as a terminal establishes the loss of a message or an erroneous message with the previously described mechanisms, it sends a repeat request, for example a negative acknowledgment (negative acknowledge NACK), which contains the sequence number of the lost message. This repeat request NACK is transmitted on one of the existing point-

15 to-point links between a respective terminal and the central station ZE. At least one of these links is always present in order to exchange control information. The central station ZE repeats the message with the old sequence number SN. Because of that a terminal can receive the same message several times. Thus it is advantageous that another terminal which is part of the broadcast zone or a

20 multi-cast group and which has already received the message with the correct sequence number erases it. Up to now only erroneous or lost message packets are acknowledged, i.e. in a repeat request whose sequence number is put in place as a negative acknowledgment NACK. Alternatively the correctly received

message packet can also be acknowledged – as a positive acknowledgment ACK. Instead of confirming a positive or negative acknowledgment, ACK or NACK, with only one sequence number, several can be entered, or all since the last acknowledgment can be positively or negatively acknowledged.

5           In order to prevent a terminal with very poor channel properties from clogging the entire transmission because of the need for frequent repeat transmissions a predetermined time window or interval is used, especially a so-called ARQ (automatic repeat request) window is used. This ARQ window is controlled so that a message can be repeated only within a predetermined time  
10 interval. The temporal granularity for this time window is the length of a message. A counter is provided for control of this time window, which increments with the sequence number SN. A modulo n counter is used particularly for that purpose, i.e. it jumps back to 0 after reaching a maximum value (N - 1) and begins to increment again. N gives the number of successive  
15 messages. The window size then is given by the length of a message multiplied by the value N - 1. A repetition is accordingly only possible within  $SN+(N-1)$  transmitted messages. Thus the number of possible sequence numbers should be at least twice the number of the size of the ARQ window, in order to obtain a definite correlation. It is advantageous to limit the number of the maximum  
20 possible repeat requests of a certain message by a single terminal in order to prevent a delay of the transmission process by a rapid series of repeat requests from one terminal.

Only the preceding seven messages are stored in the central station ZE and also accordingly a repeat of only these seven messages is possible, based on a modulo-8 window in the embodiment shown in figures 2 and 3. Fig. 2 is a message flow diagram. A central station ZE and two terminals 1 and 2 are shown in Fig. 2. The vertical lines extending from the blocks represent respective time axes so that time increases in a downward direction. The central station ZE transmits a message that includes a sequence number SN. Reception of the message is indicated by an arrow reaching the time axis of the terminal receiving it. The erroneous transmission of the message is indicated by an X.

As soon as a terminal receives a message with a sequence number larger than expected, it sends out a repeat request, i.e. a negative acknowledgment NACK with the expected sequence number SN. In Fig. 2 message 1 from terminal 1 would not be received or would be received with an error. This error is detected by the receiver of message 2 by the omitted sequence number and the repeat request NACK is sent back. After the input of the repeat request NACK to the central station ZE it transmits the corresponding message N (SN=1) again (after N(SN=3)). Terminal 1 receives now this message and resets its ARQ window. Terminal 2 has received this message already error free for the first time and rejects the repeat transmission which is indicated by the absent arrow tip or arrow head. Message 2 (SN=2) was received erroneously in contrast by terminal 2 and accordingly requests again and also transmits.

A memory is used for repetition of the messages within the ARQ window. The memory is controlled so that a message transmitted again writes over the

oldest version of the message still in the memory. Fig. 3 shows the principal process for doing that. A modulo 8 buffer is provided, in which each segment of the circle illustrated in Fig. 3 indicates a buffer location. A fresh message overwrites a respective message which is older by about eight intervals, i.e. having about eight steps lower sequence number.

The disclosure in German Patent Application 199 27 639.0 of June 17, 1999 is incorporated here by reference. This German Patent Application describes the invention described hereinabove and claimed in the claims appended hereinbelow and provides the basis for a claim of priority for the instant invention under 35 U.S.C. 119.

While the invention has been illustrated and described as embodied in a method for repeat transmission of messages in a centrally controlled communication network, it is not intended to be limited to the details shown, since various modifications and changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention.

What is claimed is new and is set forth in the following appended claims.

We claim:

1 1. A method for repeat transmission of messages in a centrally controlled  
2 communication network, in which several terminals (T1,T2,...) are simultaneously  
3 operable, said method comprising:

4 a) transmitting each of said messages only once from the central station  
5 for reception by each of said terminals (T1,T2,...) of a participating group and  
6 assigning a respective identifier to the corresponding messages to detect loss of  
7 or error in one of the messages;

8 b) as soon as one of said terminals (T1,T2,...) has detected the error in or  
9 the loss of one of the messages, said one of said terminals detecting said error  
10 or said loss issues a repeat request for said one of said messages over a  
11 communication link between the central station and the terminal (T1,T2,...)  
12 detecting said error or said loss; and

13 c) said central station (ZE) repeats said one of said messages in  
14 response to the repeat request within a predetermined time interval.

1 2. The method as defined in claim 1, wherein said centrally controlled  
2 communication network is a radio network.

1 3. The method as defined in claim 1, wherein said communication link is  
2 a point-to-point link.

1 4. The method as defined in claim 1, wherein said participating group consists of  
2 all of said terminals in said communication network.

1 5. The method as defined in claim 1, wherein said participating group consists of  
2 less than all of said terminals in said communication network.

1 6. The method as defined in claim 1, wherein each of said terminals of said  
2 participating group is assigned a temporary address.

1 7. The method as defined in claim 1, further comprising assigning at least one  
2 predefined address to each of said terminals of said participating group for  
3 broadcast and/or multi-cast operation.

1 8. The method as defined in claim 1, wherein said respective identifiers  
2 comprise corresponding sequence numbers (SN) assigned to said  
3 corresponding messages, said repeat request includes said sequence number  
4 (SN) corresponding to said one of said messages detected as lost or erroneous  
5 and said central station (ZE) repeats said one of said messages with said  
6 sequence number in said repeat request.

1 9. The method as defined in claim 8, further comprising erasing or not using  
2 another of said messages received by said one of said terminals detecting said

3    loss or said error when said another of said messages contains said sequence  
4    number of a previously correctly received message.

1    10. The method as defined in claim 1, wherein said central station (ZE) repeats  
2    said one of said messages for only a predetermined number of repetitions.

1    11. The method as defined in claim 10, wherein said predetermined number of  
2    said repetitions is determined by said predetermined time interval and is at least  
3    as great as twice a total number of said sequence numbers.

1    12. The method as defined in claim 10, wherein said predetermined number of  
2    said repetitions is limited by said one of said terminals detecting said loss or  
3    said error.

1    13. The method as defined in claim 1, wherein a respective position in said  
2    predetermined time interval is determined according a pre-established number of  
3    repeated messages and on reaching a maximum value of said pre-established  
4    number of said repeated messages an initial position in said predetermined time  
5    interval is again reached.

1    14. The method as defined in claim 1, further comprising storing transmitted  
2    messages in a memory for repetition of said transmitted messages as needed



3 and controlling said memory so that a newly transmitted message overwrites an  
4 oldest one of said transmitted messages stored in said memory.

1 15. The method as defined in claim 1, further comprising issuing a positive  
2 acknowledgement (ACK) of each correctly received one of said messages or  
3 only issuing a negative acknowledgment (NACK) of each lost or erroneous one  
4 of said messages detected in order to inform said central station (ZE) whether or  
5 not message repetition is necessary.

1 16. The method as defined in claim 1, further comprising acknowledging only  
2 said identifier in order to inform said central station (ZE) whether or not message  
3 repetition is necessary.

1 17. The method as defined in claim 8, further comprising acknowledging only at  
2 least one of said sequence numbers in order to inform said central station (ZE)  
3 whether or not message repetition is necessary.

1 18. The method as defined in claim 8, wherein a plurality of said sequence  
2 numbers of all previous ones of said messages since an immediately preceding  
3 acknowledgment are positively or negatively acknowledged in order to inform  
4 said central station (ZE) whether or not message repetition is necessary.

## ABSTRACT OF THE DISCLOSURE

In a method for repeat transmission of messages in a centrally controlled communication network including a plurality of terminals a single message transmission from the central station (ZE) is received by all terminals of a participating group (broadcast, multi-cast). As soon as a receiving terminal has detected loss of a transmitted message or an error in the transmitted message, it transmits a repeat request (NACK, ACK) for repetition of the message transmission over another communication link, especially a point-to-point communication link. The central station (ZE) repeats the message transmission of the lost or erroneous message within and for a predetermined time interval.

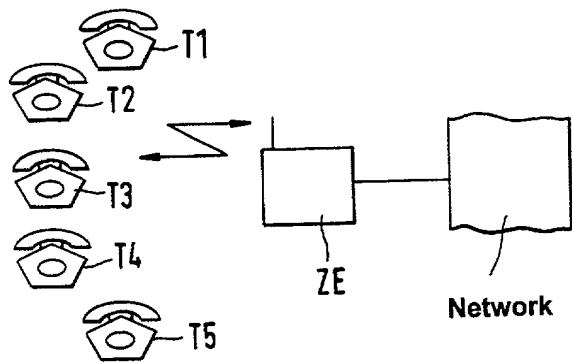


Fig.1

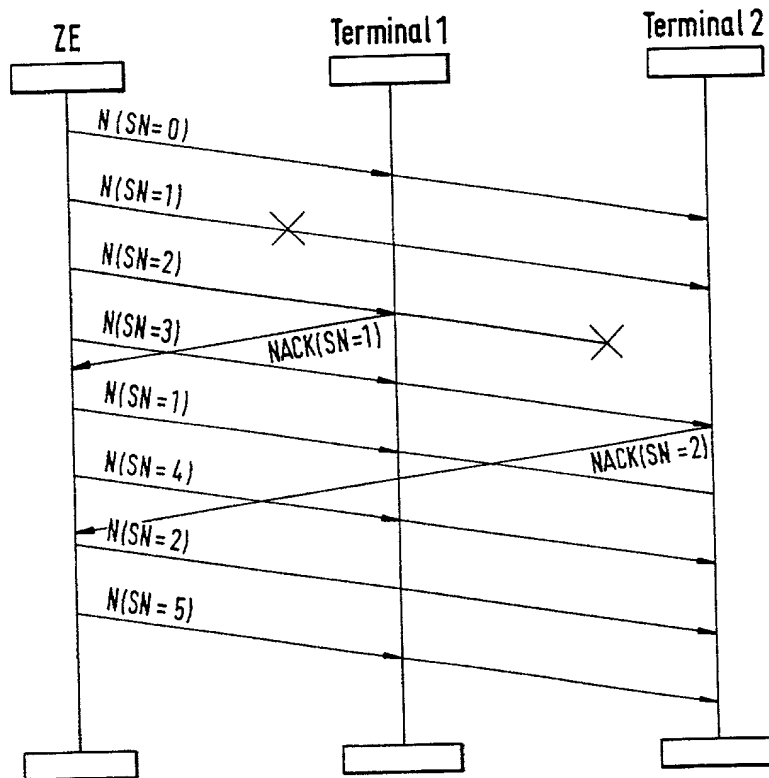


Fig.2

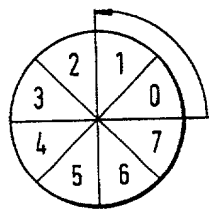


Fig.3

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

## Declaration and Power of Attorney for Patent Application Erklärung für Patentanmeldungen mit Vollmacht

### German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides  
Statt:

Vasco VOLLMER  
Markus RADIMIRSCH

dass mein Wohnsitz, meine Postanschrift und meine  
Staatsangehörigkeit den im nachstehenden nach meinem Namen  
aufgeführten Angaben entsprechen, dass ich nach bestem Wissen der  
ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein  
Name angegeben ist) oder ein ursprünglicher, erster und  
Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des  
Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein  
Patent für die Erfindung mit folgendem Titel beantragt  
wird:

VERFAHREN ZUR WIEDERHOLTEN  
ÜBERTRAGUNG VON NACHRICHTEN IN EINEM  
ZENTRAL GESTEUERTEN  
KOMMUNIKATIONSNETZ

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Vertrags über die Zusammenarbeit auf dem Gebiet des  
Patentwesens (PCT) \_\_\_\_\_ und am  
\_\_\_\_\_ abgeändert (falls  
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Ich bestätige hiermit, dass ich den Inhalt der oben angegebenen  
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Ich erkenne meine Pflicht zur Offenbarung jeglicher  
Informationen an, die zur Prüfung der Patentfähigkeit in Einklang  
mit Titel 37, § 1.56 von Belang sind.

As a below named inventor, I hereby declare that:

Vasco VOLLMER  
Markus RADIMIRSCH

My residence, post office address and citizenship are as stated next  
to my name.

I believe I am the original, first and sole inventor (if only one name  
is listed below) or an original, first and joint inventor (if plural  
names are listed below) of the subject matter which is claimed and  
for which a patent is sought on the invention entitled

METHOD OF REPEAT TRANSMISSION OF  
MESSAGES IN A CENTRALLY CONTROLLED  
COMMUNICATION NETWORK

the specification of which is attached hereto unless the following box  
is checked:

- ☐ was filed on \_\_\_\_\_  
as United States Application Number or PCT  
International Application Number \_\_\_\_\_  
and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the  
above identified specification, including the claims, as amended by  
any amendment referred to above.

I acknowledge the duty to disclose information which is material to  
patentability as defined in Title 37, Code of Federal Code of Federal  
Regulations, Regulations, § 1.56.

## German Language Declaration

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Title 35, US-Code, § 119 (a)-(d), bzw. § 365(b) aller unten aufgeführten Auslandsanmeldungen für Patente oder Erfinderurkunden, oder § 365(a) aller PCT internationalen Anmeldungen, welche wenigstens ein Land ausser den Vereinigten Staaten von Amerika benennen, und habe nachstehend durch ankreuzen sämtliche Auslandsanmeldungen für Patente bzw. Erfinderurkunden oder PCT internationale Anmeldungen angegeben, deren Anmeldetag dem der Anmeldung, für welche Priorität beansprucht wird, vorangeht.

Prior Foreign Applications  
(Frühere ausländische Anmeldungen)

199 27 639.0 GERMANY  
(Number) (Country)  
(Nummer) (Land)

(Number) (Country)  
(Nummer) (Land)

Ich beanspruche hiermit Prioritätsvorteile unter Title 35, US-Code, § 119(e) aller US-Hilfsanmeldungen wie unten aufgezählt.

(Application No.) (Filing Date)  
(Akzenzeichen) (Anmeldetag)

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(Application No.) (Filing Date)  
(Akzenzeichen) (Anmeldetag)

(Application No.) (Filing Date)  
(Akzenzeichen) (Anmeldetag)

Ich erkläre hiermit, dass alle in der vorliegenden Erklärung von mir gemachten Angaben nach bestem Wissen und Gewissen der Wahrheit entsprechen, und ferner dass ich diese eidesstattliche Erklärung in Kenntnis dessen ablege, dass wissentlich und vorsätzlich falsche Angaben oder dergleichen gemäss § 1001, Title 18 des US-Code strafbar sind und mit Geldstrafe und/oder Gefängnis bestraft werden können und dass derartige wissentlich und vorsätzlich falsche Angaben die Rechtswirksamkeit der vorliegenden Patentanmeldung oder eines aufgrund deren erteilten Patentes gefährden können..

I hereby claim foreign priority under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Priority Not Claimed  
Priorität nicht beansprucht

JUNE 17, 1999 ☐  
(Day/Month/Year Filed)  
(Tag/Monat/Jahr der Anmeldung)

(Day/Month/Year Filed)  
(Tag/Monat/Jahr der Anmeldung)

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(Status) (patented, pending, abandoned)  
(Status) (patentiert, schwebend, aufgegeben)

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

**German Language Declaration**

VERTRETUNGSVOLMACHT: Als benannter Erfinder beauftrage ich hiermit den (die) nachstehend aufgeführten Patentanwalt (älte) und/oder Vertreter mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Angelegenheiten vor dem US-Patent- und Markenamt: *(Name(n) und Registrationsnummer(n) auflisten)*

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